Fall 2020

CHEM 125-101: General Chemistry I

Patrick DePaolo

NJIT New Jersey Institute of Technology

THE COLLEGE OF SCIENCE AND LIBERAL ARTS

THE DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE

Chemistry:
Fall 2020 Course Syllabus

NJIT Academic Integrity Code: All Students should be aware that the Department of Chemistry & Environmental Science (CES) takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

COURSE INFORMATION

Course Description: CHEM 125: General Chemistry I Section 101

Time(s): Thursdays 6:00PM – 8:50 PM

Instructor: Patrick DePaolo

Location(s): CTR BALL A (Campus Center) and Zoom web seminar

Number of Credits: 3

Corequisites: Math 110 or equivalent

Email and Phone (text only): depaolo@njit.edu; patdepaolo@gmail.com; 732-284-6803

Office Hours: Monday and Thursday 5:00PM-6:00PM Tiernan 114 or by appointment

Course-Section and Instructors

Course-Section	Instructor
CHEM-125-101	Patrick DePaolo

Required Textbook:

Title	Chemistry, A Molecular Approach
Author	Nivaldo J. Tro
Edition	Fifth
Publisher	Pearson
ISBN #	ISBN-13: 978-0134874371

University-wide Withdrawal Date: The last day to withdraw with a **W** is Monday, November 9, 2020. It will be strictly enforced.

Learning Outcomes:

1. Learn measurement units and perform unit conversions systematically using dimensional analysis or multiplication by one

2. Explain atomic structure and determine average atomic mass.

3. Learn to use periodic table to predict charges on atoms.

4. Understand mole concept: convert mass into moles and vice versa

5. Write chemical formulas of compounds using the periodic table and name ions and simple compounds.

6. Calculate mass of molecules, and mass % of individual atoms in compounds

7. Calculate moles, molecular and empirical formula of a compound from basic principles using proper unit conversions

8. Balance chemical equations

9. Identify various types of chemical reactions and apply the concept of limiting reagent to calculate percentage yield of products in different reaction types.

10. Define solute, solvent and apply mole concept in aqueous solutions.

11. Determine oxidation states of elements in compounds

12. Describe acid-base, precipitation and redox reactions in solution

13. Understand Kinetic model of gases and apply various gas laws in problem solving.

14. Apply first law of thermodynamics to chemical problems and calculate the energy changes in chemical reactions

15. Explain the quantum mechanical basis for the sub-structure of the atom

16. Write the electronic configuration for the elements in the periodic table and describe trends in periodic properties

17. Draw the Lewis dot structures for simple molecules and exceptions to octet rule

18. Discuss electronegativity and bond polarity

19. Use VSEPR to predict shapes of molecules and whether a molecule will have a dipole moment

20. Identify sigma and pi bonds and explain the hybridization of the molecules

21. Explain intermolecular force and the differences in bonding patterns between solids liquids and gases

22. Describe differences in basic crystalline shapes

23. Determine edge length and density of simple crystalline shapes.

24. Predict changes in freezing point, elevation in boiling point and osmotic pressure when a solute dissolves in a pure solvent

POLICIES

All CES students must familiarize themselves with, and adhere to, all official university-wide student policies. CES takes these policies very seriously and enforces them strictly.

Grading Policy: The final grade in this course will be determined as follows:

Homework (Basic HW: 60 + Regular HW 100) points	160
Class Participation (recitation + lecture)	190
Common Exam I	125
Common Exam II	125
Common Exam III	125
Final Exam	275
Total points	1000

Your final letter grade in this course will be based on the following tentative curve:

A	>835	**C**	600-659
B+	775-834	**D**	550-599
B	710-774	**F**	<550
C+	660-709		

You must maintain an average of 35%, which is 228 points in the common exams and finals to be considered for a grade of D or higher. You will receive an F even if you have adequate point total without this requirement.

Attendance Policy: Attend class either in-person or virtually on zoom. Attendance will count toward your class participation grade. If you have a valid reason to miss a class, please let me know. **In person attendance is limited to 15 students.** We will practice social distancing in the classroom. There will be a sign-up sheet for in person attendance on Canvas that will be filled on a first-come, first-serve basis.

Homework Policy: There will be both basic homework and regular homework assignments to be completed on canvas. The basic homeworks are to be completed during class while the regular homeworks will be due one week after the covered material, as per the detailed schedule below.

Exams: There will be three exams held in class/on zoom during the semester and one comprehensive final exam. The following exam dates are tentative and therefore possibly subject to change:

Common Exam 1	Thursday, September 24th
Common Exam 2	Thursday, October 29th
Common Exam 3	Thursday, December 3rd
Final Exam	Thursday, December 17th

The final exam will test your knowledge of all the course material taught in the entire course.

Makeup Exam Policy: There will normally be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event that a student has a legitimate reason for missing a quiz or exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the CES Department Office/Instructor that the exam will be missed so that appropriate steps can be taken to make up the grade.

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times. Such devices must be stowed in bags during exams or quizzes.

ADDITIONAL RESOURCES

Chemistry Tutoring Center: Located in the Central King Building, Lower Level, Rm. G12. Hours of operation are Monday – Friday 10:00 am - 6:00 pm. For further information please click here.

Accommodation of Disabilities: Office of Accessibility Resources and Services (***formerly known as Disability Support Services***) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please contact Chantonette Lyles, Associate Director at the Office of Accessibility Resources and Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. A Letter of Accommodation Eligibility from the Office of Accessibility Resources Services office authorizing your accommodations will be required.

For further information regarding self-identification, the submission of medical documentation and additional support services provided please visit the Accessibility Resources and Services (OARS) website at:

- http://www5.njit.edu/studentsuccess/disability-support-services/

Important Dates See: Fall 2020 Academic Calendar, Registrar
https://www5.njit.edu/registrar/fall-2020-academic-calendar/

Date	Day	Event
September 1	T	First Day of Classes
September 5	S	Saturday Classes Begin
September 7	M	Labor Day
September 8	T	Monday Classes Meet Last Day to Add/Drop a Class Last Day for 100% Refund, Full or Partial Withdrawal
September 9	W	W Grades Posted for Course Withdrawals
September 14	M	Last Day for 90% Refund, Full or Partial Withdrawal No Refund for Partial Withdrawal after this date
September 28	M	Last Day for 50% Refund, Full Withdrawal
October 19	M	Last Day for 25% Refund, Full Withdrawal
November 9	M	Last Day to Withdraw
November 25	W	Friday Classes Meet
November 26	R	Thanksgiving Recess Begins
November 29	Su	Thanksgiving Recess Ends
December 10	R	Last Day of Classes
December 11	F	Reading Day 1
December 14	M	Reading Day 2
December 15	T	Final Exams Begin
December 21	M	Final Exams End
December 23	W	Final Grades Due

Course Outline

Week	Wednesday (Assignment Due Date 11:59PM)	Thursday (Lecture)	Sunday (Assignment Due Date 11:59PM)
1		3-Sep	
Material		**Chapter 1**	
Assignments Due		Warm-up Basic Homework	
2	9-Sep	10-Sep	
Material		**Chapter 2**	
Assignments Due	Chapter 1 Basic Homework 1	Chapter 2 Basic Homework	
	Chapter 1 Basic Homework 2		
	Chapter 1 Regular Homework		
3	16-Sep	17-Sep	
Material		**Chapter 3**	
Assignments Due	Chapter 2 Regular Homework	Chapter 3 Basic Homework	
4	23-Sep	24-Sep	
Material		**Exam 1 (Chapters 1-3)**	
Assignments Due	Chapter 3 Regular Homework		
5	30-Sep	1-Oct	
Material		**Chapter 4**	
Assignments Due		Chapter 4 Basic Homework	
6	7-Oct	8-Oct	
Material		**Chapter 5**	
Assignments Due	Chapter 4 Regular Homework 1	Chapter 5 Basic Homework	
	Chapter 4 Regular Homework 2		
7	14-Oct	15-Oct	
Material		**Chapter 6**	
Assignments Due	Chapter 5 Regular Homework	Chapter 6 Basic Homework	
	Chapter 5 Extra Credit Worksheet		
8	21-Oct	22-Oct	
Material		**Chapter 7**	
Assignments Due	Chapter 6 Regular Homework	Chapter 7 Basic Homework	

9	28-Oct	29-Oct	
Material		**Exam 2 (Chapters 4-7), Chapter 8**	
Assignments Due	Chapter 7 Regular Homework		
10	4-Nov	5-Nov	
Material		**Chapter 8/9**	
Assignments Due		Chapter 8 Basic Homework	
		Chapter 9 Basic Homework	
11	11-Nov	12-Nov	
Material		**Chapter 10**	
Assignments Due	Chapter 8 Regular Homework	Chapter 10 Basic Homework	
	Chapter 9 Regular Homework		
12	18-Nov	19-Nov	
Material		**Chapter 11**	
Assignments Due	Chapter 10 Regular Homework	Chapter 11 Basic Homework	
13	25-Nov	26-Nov	
Material		**No Class: Thanksgiving**	
Assignments Due			
14	2-Dec	3-Dec	
Material		**Exam 3 (Chapters 8-11)**	
Assignments Due	Chapter 11 Regular Homework 1		
	Chapter 11 Regular Homework 2		
15	9-Dec	10-Dec	
Material		**Chapters 12-14 + Final Exam Review**	
Assignments Due			Review ACS 1-6
			Extra Credit: Basic Homework Review Ch. 1-8
			Extra Credit: Basic Homework Review Ch. 9-12
15	6-Jul	17-Dec	20-Dec
Material		**Final Exam (Chapters 1-14)**	
Assignments Due			Extra Credit: Chapter 12 Basic Homework
			Extra Credit: Chapter 12 Regular Homework
			Extra Credit: Chapter 13 Basic Homework
			Extra Credit: Chapter 14 Basic Homework
			Extra Credit: Chapter 14 Regular Homework